



# CHAPTER 27

## Working with System Software Images

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This chapter describes how to work with system software image files on the Catalyst 6500 series switches.



**Note**

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For complete syntax and usage information for the commands that are used in this chapter, refer to the *Catalyst 6500 Series Switch Command Reference* publication.

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# Software Image Naming Conventions

(software release 7.3(1) images for a Supervisor Engine 2 are used in the examples):

- 7.3(1) flash image (standard)—cat6000-sup2k8.7-3-1.bin
- 7.3(1) flash image (CiscoView)—cat6000-sup2cvk8.7-3-1.bin
- 7.3(1) flash image (Secure Shell)—cat6000-sup2k9.7-3-1.bin
- 7.3(1) flash image (Secure Shell and CiscoView)—cat6000-sup2cvk9.7-3-1.bin



## Note

The sup2cvk8, sup2k9, and sup2cvk9 designations are as follows: sup2cvk8 is a CiscoView image, sup2k9 is a Secure Shell image, and sup2cvk9 is a Secure Shell and CiscoView image.

## Upgrading the EPLD Images



## Note

The supervisor engine EPLD upgrades are supported only on Supervisor Engine 2 and Supervisor Engine 720. The nonsupervisor engine module (switching modules and service modules) EPLD upgrades are supported using Supervisor Engine 1, Supervisor Engine 2, or Supervisor Engine 720.

The EPLD image for Supervisor Engine 2 and Supervisor Engine 720 is included in the Catalyst supervisor engine software image. The EPLD image for the nonsupervisor engine modules is provided in a separate downloadable image.

## Upgrading the Supervisor Engine EPLD Image

The supervisor engine EPLD upgrade is performed automatically when you reset or power cycle the switch. You can use the **set system supervisor-update** command to modify the EPLD upgrade process. By default, the supervisor engine EPLD upgrade is disabled. In the **automatic** mode, the system checks the version level of the bundled EPLD image and performs the upgrade if the bundled EPLD image version is greater than the existing version. If you specify the **force** keyword, the system upgrades the existing EPLD image with the bundled EPLD image regardless of the version level. After a forced upgrade, the configuration reverts back to the **automatic** default setting. The **disable** keyword disables the automatic EPLD upgrade process.

To upgrade the supervisor engine EPLD image, perform this task in privileged mode:

	Task	Command
Step 1	Upgrade the supervisor engine EPLD image.	<b>set system supervisor-update</b> { <b>automatic</b>   <b>disable</b>   <b>force</b> }
Step 2	Verify the supervisor engine EPLD image upgrade.	<b>show system supervisor-update</b>

This example shows how to specify the **automatic** keyword for the EPLD upgrades:

```
Console> (enable) set system supervisor-update automatic
Down-rev supervisor EPLD's will be re-programmed next reset.
Console> (enable)
```

This example shows how to specify the **force** keyword for the EPLD upgrades:

```
Console> (enable) set system supervisor-update force
Supervisor EPLD's will synchronize to the image bundle during the next reset.
Console> (enable)
```

This example shows how to disable the EPLD upgrades:

```
Console> (enable) set system supervisor-update disable
Supervisor EPLD update during reset is disabled.
Console> (enable)
```

This example shows how to display the EPLD upgrade configuration:

```
Console> (enable) show system supervisor-update
Supervisor EPLD update: disabled
Console> (enable)
```

## Upgrading the Nonsupervisor Engine Module EPLD Images



### Caution

Do not power off or reset the switch or module during the upgrade process. Powering off or resetting the switch or module could leave the module in an unusable state.



### Note

Before you begin the procedures in this chapter, make sure that you have downloaded the new EPLD upgrade image to the supervisor engine flash memory (bootflash: or slot0:).

You can upgrade the nonsupervisor engine module EPLD image by using the **download** command with the **epld** keyword. If you enter the **download epld file** command without specifying a module, the new EPLD image is downloaded to all compatible modules where the new EPLD image version is greater than the existing version on the module. If you use the **download epld file mod** command with the **force** keyword, the existing EPLD image on a module is upgraded with the new EPLD image regardless of the existing version level.

To upgrade the EPLD on the nonsupervisor engine modules (switching modules and service modules), perform this task in privileged mode:

	Task	Command
Step 1	Upgrade the nonsupervisor engine EPLD image.	<b>download epld file</b> <b>download epld file mod [force]</b>
Step 2	Verify the EPLD upgrade process configuration.	<b>show version epld mod</b>

This example shows how to upgrade the EPLD image on the module in slot 5:

```

Console> (enable) download epld aq_cr128_art.bin 5 force
CCCCC
Device found requiring upgrade in slot 5.

#####
#                               W A R N I N G                               #
#                               #                                           #
# Any disruptions to the module during programming may #
# leave the module or system in an inconsistent state. #
# Please ensure that the system or module does not get #
# switched off or reset during the programming process.#
# Programming may take a minute or two, depending on #
# the number of devices updated. Please wait for the #
# module to come back online before continuing.       #
#                                                     #
#                               W A R N I N G                               #
#####
This command may reset module 5.
Updating fabric modules may significantly affect system performance while the update is
occurring.

Do you wish to update the devices in slot 5 (y/n) [n]? y

Updating programmable devices in slot 5. This may take a minute...
Programming successful, updating EPLD revisions.
2002 Aug 09 06:32:22 %SYS-4-NVLOG:EpldUpdate:Module 5 EPLD A updated from rev 1 to rev 1
Waiting for module to come online.
.....2002 Aug 09 06:32:33 %SYS-5-MOD_OK:Module 5 is online
.

#####
E P L D   P R O G R A M M I N G   C O M P L E T E

Found 1 devices requiring upgrades, 1 attempted, 1 updated, 0 failed

#####
Console> (enable) 2002 Aug 09 06:32:34 %SYS-4-NVLOG:EpldUpdate:Module 5 EPLD A s
prom updated to rev 1
Console> (enable)

```

# Comparing File Transfer Protocols

Table 27-1 compares the supported file transfer protocols.

**Table 27-1** Comparison of File Transfer Protocols

Requirement	TFTP	RCP	FTP	SCP	SFTP
Username needed	No	Yes	Yes	Yes	Yes
Password needed	No	No	Yes	Yes <sup>1</sup>	Yes
Can run as a client	Yes	Yes	Yes	Yes	Yes
Can run as a server	Yes	No	No	No	No
Secure authentication	N/A	No	No	Yes	Yes
Secure file transfer	No	No	No	Yes	Yes
Available in the standard flash images	Yes	Yes	Yes	No	No
Available in crypto images	Yes	Yes	Yes	Yes	Yes

1. SCP authentication through “.shosts” can be used to avoid login but most SSH publications recommend not using it due to security concerns.

## Downloading the Software Images Using FTP or TFTP

These sections describe how to download the system software images to the switch supervisor engine and to the intelligent modules:

- [Understanding How FTP and TFTP Software Image Downloads Work, page 27-5](#)
- [Specifying the FTP Username and Password, page 27-6](#)
- [Preparing to Download an Image Using FTP or TFTP, page 27-7](#)
- [Downloading the Supervisor Engine Images Using FTP or TFTP, page 27-7](#)
- [Downloading the Switching Module Images Using FTP or TFTP, page 27-8](#)
- [FTP and TFTP Download Procedures Example, page 27-9](#)

## Understanding How FTP and TFTP Software Image Downloads Work

You can download the system software images to the switch using the File Transfer Protocol (FTP) or Trivial File Transfer Protocol (TFTP). TFTP allows you to download the system image files over the network from a TFTP server. FTP allows you to download the system image files over the network from a FTP server.

Some modules, such as the ATM modules, have their own onboard flash memory. When you download a software image file, the switch checks the header of the image file to determine the type of software image.

Depending on the type of software image that you are downloading, one of the following occurs:

- Supervisor engine software image—The image file is downloaded to the supervisor engine flash memory. You can store multiple image files on the flash memory system devices (such as boot flash and Flash PC cards).
- Intelligent module software images—If you specified a module number, the image file is downloaded to the specified module only (if the image file is designed for the specified module type). If you do not specify a module number, the image file is downloaded to every module of the appropriate type. The file is relayed packet by packet to the appropriate modules using the Inter-Process Communications protocol that is internal to the system, with communication taking place across the switching bus. Downloading a software image to multiple modules significantly speeds up the process of updating the software on multiple modules of the same type.


**Note**

For more information on working with the system software image files on the flash file system, see [Chapter 26, “Working With the Flash File System.”](#)

## Specifying the FTP Username and Password

FTP allows you to specify a username and password to be used for the FTP connection.

To specify the username and password, perform these steps:

- 
- Step 1** Enter the `set ftp username new_ftp_username` command.
- Step 2** Enter the `set ftp password` command.
- 

This example shows how to set the FTP username:

```
Console> (enable) set ftp username doc_people
ftp username set to doc_people
```

This example shows how to set the FTP password:

```
Console> (enable) set ftp password
Enter password for User 'doc_people':
Retype password for User 'doc_people':
ftp password set.
```

This example shows how to clear the FTP username:

```
Console> (enable) clear ftp username
```

This example shows how to clear the FTP password:

```
Console> (enable) clear ftp password
```

You can also connect to an FTP server using passive mode. In passive mode, the client initiates the connection to the server. To use passive mode, enter the `set ftp passive` command.

## Preparing to Download an Image Using FTP or TFTP

Before you begin downloading a software image using FTP or TFTP, do the following:

- Verify that the workstation acting as the TFTP server is configured properly. When using TFTP on a Sun workstation, verify that the `/etc/inetd.conf` file contains this line:

```
tftp dgram udp wait root /usr/etc/in.tftpd in.tftpd -p -s /tftpboot
```

Verify that the `/etc/services` file contains this line:

```
tftp 69/udp
```

When using FTP on a Sun workstation, verify that the `/etc/inetd.conf` file contains this line:

```
ftp stream tcp nowait root /usr/sbin/tcpd in.ftpd
```

Verify that the `/etc/services` file contains this line:

```
ftp 21/udp
```



---

**Note** You must restart the `inetd` daemon after modifying the `/etc/inetd.conf` and `/etc/services` files. To restart the daemon, either stop the `inetd` process and restart it, or enter a **fastboot** command (on the SunOS 4.x) or a **reboot** command (on Solaris 2.x or SunOS 5.x). Refer to the documentation for your workstation for more information on using the FTP or TFTP daemon.

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- Verify that the switch has a route to the FTP or TFTP server. The switch and the FTP or TFTP server must be in the same subnetwork if you do not have a router to route the traffic between the subnets. Check connectivity to the FTP or TFTP server by entering the **ping** command.
- Verify that the software image to be downloaded is in the correct directory on the FTP or TFTP server.
- Verify that the permissions on the file are set correctly. The permissions on the file should be set to world-read.
- Note that a power interruption (or other problem) during the download procedure can corrupt the flash code. If the flash code is corrupted, you can connect to the switch through the console port and boot from an uncorrupted system image on a Flash PC card.

## Downloading the Supervisor Engine Images Using FTP or TFTP



**Note**

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If you have a redundant supervisor engine, you cannot download a system image directly from an FTP or TFTP server to the flash memory on the standby supervisor engine. When you download the image to the active supervisor engine, the standby supervisor engine synchronizes automatically with the new image. In addition, you cannot copy an image from the standby supervisor engine to the active supervisor engine.

---

To download a supervisor engine software image to the switch from an FTP or TFTP server, perform these steps:

- 
- Step 1** Copy the software image file to the appropriate FTP or TFTP directory on the workstation.
  - Step 2** Log into the switch through the console port or through a Telnet session. If you log in using Telnet, your Telnet session disconnects when you reset the switch to run the new software.
  - Step 3** Enter the **copy ftp flash** or **copy tftp flash** command. When prompted, enter the IP address or host name of the TFTP server and the name of the file to download. On those platforms that support the flash file system, you are also prompted for the flash device to which to copy the file and the destination filename. The switch downloads the image file from the FTP or TFTP server to the specified flash device.




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**Note** The switch remains operational while the image downloads.

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- Step 4** Modify the BOOT environment variable using the **set boot system flash device:filename prepend** command, so that the new image boots when you reset the switch. Specify the flash device (*device:*) and the filename of the downloaded image (*filename*).
  - Step 5** Reset the switch by entering the **reset system** command. If you are connected to the switch through Telnet, your Telnet session disconnects.  
  
During startup, the flash memory on the supervisor engine is reprogrammed with the new flash code.
  - Step 6** When the switch reboots, enter the **show version** command to check the version of the code on the switch.
- 




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**Note** For examples that show the complete FTP or TFTP download procedures for the various supervisor engine and switch types, see the [“FTP and TFTP Download Procedures Example”](#) section on page 27-9.

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## Downloading the Switching Module Images Using FTP or TFTP

To download a software image to an intelligent module, perform these steps:

- 
- Step 1** Copy the software image file to the appropriate FTP or TFTP directory on the workstation.
  - Step 2** Log into the switch through the console port or a Telnet session. If you log in using Telnet, your Telnet session might disconnect when you reset the modules to run the new software.
  - Step 3** If there is only one module of the type that is appropriate for the image, or if there are multiple modules of the same type and you want to update the image on all of them, enter the **copy ftp flash** or **copy tftp flash** command. When prompted, enter the IP address or the host name of the TFTP server, the name of the file to download, the flash device to which to copy the file, and the destination filename.

**Step 4** If there are multiple modules of the type that is appropriate for the image but you only want to update a single module, enter the **copy ftp *m*/bootflash:** or **copy tftp *m*/bootflash:** command, where *m* is the number of the module to which to download the software image.



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**Note** If you do not specify a module number, the switch examines the header of the image file to determine to which modules the software is downloaded. The image is then downloaded to all the modules of that type.

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The switch downloads the image file, erases the flash memory on the appropriate modules, and reprograms the flash memory with the downloaded flash code.



---

**Note** All modules in the switch remain operational while the image downloads.

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**Step 5** Reset the appropriate modules by entering the **reset *mod*** command. If you are connected through Telnet, your Telnet session disconnects if you reset the module through which your connection was made.

**Step 6** When the upgraded modules come online, enter the **show version [*mod*]** command to check the version of the code on the switch.



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**Note** For examples that show the complete procedures on FTP and TFTP downloads to the intelligent modules, see the [“Single Module Image Download Example”](#) section on page 27-12 and the [“Multiple Module Image Download Example”](#) section on page 27-13.

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## FTP and TFTP Download Procedures Example

These sections show example TFP and TFTP download procedures:

- [Supervisor Engine Image Download Example, page 27-9](#)
- [Single Module Image Download Example, page 27-12](#)
- [Multiple Module Image Download Example, page 27-13](#)

## Supervisor Engine Image Download Example



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**Note** For a procedure on downloading a supervisor engine software image from an FTP or TFTP server, see the [“Downloading the Supervisor Engine Images Using FTP or TFTP”](#) section on page 27-7.

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```

Leaving power_on_diags

Cafe Daughter Present.

EOBC link up

Boot image: bootflash:cat6000-sup2k8.7-7-1.bin,1
Flash Size = 0X1000000, num_flash_sectors = 64
readCafe2Version: 0x00000001
RIn Local Test Mode, Pinnacle Synch Retries: 2
Running System Diagnostics from this Supervisor (Module 1)
This may take up to 2 minutes....please wait

Cisco Systems Console

Enter password:
07/21/1998,13:52:51:SYS-5:Module 1 is online
07/21/1998,13:53:11:SYS-5:Module 4 is online
07/21/1998,13:53:11:SYS-5:Module 5 is online
07/21/1998,13:53:14:PAGP-5:Port 1/1 joined bridge port 1/1.
07/21/1998,13:53:14:PAGP-5:Port 1/2 joined bridge port 1/2.
07/21/1998,13:53:40:SYS-5:Module 2 is online
07/21/1998,13:53:45:SYS-5:Module 3 is online
Console>

```

## Single Module Image Download Example



### Note

For a procedure on downloading the software images to the intelligent modules, see the [“Downloading the Switching Module Images Using FTP or TFTP”](#) section on page 27-8.

This example shows a complete TFTP download procedure of an ATM software image to a single ATM module:

```

Console> (enable) show version 4
Mod Port Model      Serial #  Versions
-----
4   1   WS-X6101   003414855  Hw : 1.2
                                   Fw : 1.3
                                   Sw : 3.2(6)

Console> (enable) copy tftp 4/flash
IP address or name of remote host []? 172.20.52.3
Name of file to copy from []? cat6000-atm.3-2-7.bin
Download image tftp:cat6000-atm.3-2-7.bin to Module 4 FLASH (y/n) [n]? y
This command will reset Download Module(s) you selected.

Do you wish to continue download flash (y/n) [n]? y
-
Download done for module 4, please wait for it to come online

File has been copied successfully.

```

```
Console> (enable) 07/21/1998,13:13:54:SYS-5:Module 4 is online
```

```
Console> (enable) show version 4
Mod Port Model      Serial #  Versions
-----
4   1   WS-X6101   003414855 Hw : 1.2
                                   Fw : 1.3
                                   Sw : 3.2(7)

Console> (enable)
```

This example shows a complete FTP download procedure of an ATM software image to a single ATM module:

```
Console> (enable) show version 4
Mod Port Model      Serial #  Versions
-----
4   1   WS-X6101   003414855 Hw : 1.2
                                   Fw : 1.3
                                   Sw : 3.2(6)

Console> (enable) copy ftp 4/flash
IP address or name of remote host []? 172.20.52.3
Name of file to copy from []? c6atm-lc-mz.121-14.E1.bin
Download image tftp:c6atm-lc-mz.121-14.E1.bin to Module 4 FLASH (y/n) [n]? y
This command will reset Download Module(s) you selected.

Do you wish to continue download flash (y/n) [n]? y
-
Download done for module 4, please wait for it to come online

File has been copied successfully.
Console> (enable) 04/29/2003,13:13:54:SYS-5:Module 4 is online

Console> (enable) show version 4
Mod Port Model      Serial #  Versions
-----
4   1   WS-X6101   003414855 Hw : 1.2
                                   Fw : 1.3
                                   Sw : 3.2(7)

Console> (enable)
```

## Multiple Module Image Download Example



### Note

For a procedure on downloading the software images to the intelligent modules, see the [“Downloading the Switching Module Images Using FTP or TFTP”](#) section on page 27-8.

This example shows a complete TFTP download procedure of an ATM software image to multiple ATM modules:

```
Console> (enable) show version 4
Mod Port Model      Serial #  Versions
-----
4   1   WS-X6101   003414855 Hw : 1.2
                                   Fw : 1.3
                                   Sw : 3.2(6)
```

```

Console> (enable) show version 5
Mod Port Model      Serial #  Versions
-----
5   1   WS-X6101   003414463 Hw : 1.2
                               Fw : 1.3
                               Sw : 3.2(6)

Console> (enable) copy tftp flash
IP address or name of remote host []? 172.20.52.3
Name of file to copy from []? cat6000-atm.3-2-7.bin
Download image tftp:cat6000-atm.3-2-7.bin to Module 4 FLASH (y/n) [n]? y
Download image tftp:cat6000-atm.3-2-7.bin to Module 5 FLASH (y/n) [n]? y
This command will reset Download Module(s) you selected.

Do you wish to continue download flash (y/n) [n]? y
-
Download done for module 4, please wait for it to come online

Download done for module 5, please wait for it to come online

File has been copied successfully.
Console> (enable) 07/21/1998,12:25:10:SYS-5:Module 4 is online
07/21/1998,12:25:10:SYS-5:Module 5 is online

Console> (enable) show version 4
Mod Port Model      Serial #  Versions
-----
4   1   WS-X6101   003414855 Hw : 1.2
                               Fw : 1.3
                               Sw : 3.2(7)

Console> (enable) show version 5
Mod Port Model      Serial #  Versions
-----
5   1   WS-X6101   003414463 Hw : 1.2
                               Fw : 1.3
                               Sw : 3.2(7)

Console> (enable)

```

## Uploading the System Software Images to an FTP or TFTP Server

These sections describe how to upload the system software images from a switch to an FTP or TFTP server:

- [Preparing to Upload an Image to an FTP or TFTP Server, page 27-15](#)
- [Uploading the Software Images to an FTP or TFTP Server, page 27-15](#)



### Note

For more information on working with the system software image files on the flash file system, see [Chapter 26, “Working With the Flash File System.”](#)

## Preparing to Upload an Image to an FTP or TFTP Server

Before you attempt to upload a software image to an FTP or TFTP server, do the following:

- Verify that the workstation acting as the FTP or TFTP server is configured properly. When using FTP on a Sun workstation, make sure that the `/etc/inetd.conf` file contains this line:

```
ftp stream tcp nowait root /usr/sbin/tcpd in.ftpd
```

Verify that the `/etc/services` file contains this line:

```
ftp 21/udp
```

When using TFTP on a Sun workstation, verify that the `/etc/inetd.conf` file contains this line:

```
tftp dgram udp wait root /usr/etc/in.tftpd in.tftpd -p -s /tftpboot
```

Verify that the `/etc/services` file contains this line:

```
tftp 69/udp
```



---

**Note** You must restart the `inetd` daemon after modifying the `/etc/inetd.conf` and `/etc/services` files. To restart the daemon, either stop the `inetd` process and restart it, or enter a **fastboot** command (on the SunOS 4.x) or a **reboot** command (on Solaris 2.x or SunOS 5.x). Refer to the documentation for your workstation for more information on using the TFTP daemon.

---

- Verify that the switch has a route to the FTP or TFTP server. The switch and the FTP or TFTP server must be in the same subnetwork if you do not have a router to route the traffic between the subnets. Check the connectivity to the FTP or TFTP server by entering the **ping** command.
- Note that you might need to create an empty file on the FTP or TFTP server before uploading the image. To create an empty file, enter the **touch filename** command, where *filename* is the name of the file that you will use when uploading the image to the server.
- If you are overwriting an existing file (including an empty file, if you had to create one), verify that the permissions on the file are set correctly. The permissions on the file should be world-write.

## Uploading the Software Images to an FTP or TFTP Server

To upload a software image on a switch to an FTP or TFTP server for storage, perform these steps:

- 
- Step 1** Log into the switch through the console port or a Telnet session.
- Step 2** Upload the software image to the FTP or TFTP server with the **copy flash ftp** or **copy flash tftp** command. When prompted, specify the FTP or TFTP server address and destination filename. On those platforms that support the flash file systems, you are first prompted for the flash device and the source filename. If desired, you can enter the **copy file-id ftp** or **copy file-id tftp** command on these platforms. The software image is uploaded to the FTP or TFTP server.
-



**Step 3** Download the software image from the rcp server by entering the **copy rcp flash** command. When prompted, enter the IP address or host name of the rcp server and the name of the file to download. On those platforms that support the flash file system, you are also prompted for the flash device to which to copy the file and the destination filename.

The switch downloads the image file from the rcp server.



---

**Note** The switch remains operational while the image downloads.

---

**Step 4** Modify the BOOT environment variable by entering the **set boot system flash device:filename prepend** command, so that the new image boots when you reset the switch. Specify the flash device (*device:*) and the filename of the downloaded image (*filename*).

**Step 5** Reset the switch by entering the **reset system** command. If you are connected to the switch through Telnet, your Telnet session disconnects.

During startup, the flash memory on the supervisor engine is reprogrammed with the new flash code.

**Step 6** When the switch reboots, enter the **show version** command to check the version of the code on the switch.

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## Downloading the Switching Module Images Using rcp

To download a software image to an intelligent module on a Catalyst 6500 series switch, perform these steps:

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**Step 1** Copy the software image file to the appropriate rcp directory on the workstation.

**Step 2** Log into the switch through the console port or a Telnet session. If you log in using Telnet, your Telnet session might disconnect when you reset the modules to run the new software.

**Step 3** Enter the command that is appropriate for your switch and supervisor engine to download the software image from the rcp server:

- If there is only one module of the type that is appropriate for the image, or if there are multiple modules of the same type and you want to update the image on all of them, enter the **copy rcp flash** command. When prompted, enter the IP address or host name of the rcp server, the name of the file to download, the flash device to which to copy the file, and the destination filename.
- If there are multiple modules of the type that is appropriate for the image but you only want to update a single module, enter the **copy rcp | m/bootflash:** command, where *m* is the number of the module to which to download the software image. If you do not specify the module, all the modules of the same type will be updated.



---

**Note** If you do not specify a module number, the switch examines the header of the image file to determine to which modules the software is downloaded. The image is then downloaded to all the modules of that type.

---

The switch downloads the image file, erases the flash memory on the appropriate modules, and reprograms the flash memory with the downloaded flash code.




---

**Note** All the modules in the switch remain operational while the image downloads.

---

- Step 4** Reset the appropriate modules using the **reset mod** command. If you are connected through Telnet, your Telnet session disconnects if you reset the module through which your connection was made.
- Step 5** When the upgraded modules come online, enter the **show version [mod]** command to check the version of the code on the switch.
- 

## Example rcp Download Procedures

These sections show example rcp download procedures:

- [Supervisor Engine Image rcp Download Example, page 27-18](#)
- [Single Module Image rcp Download Example, page 27-20](#)
- [Multiple Module Image rcp Download Example, page 27-20](#)

## Supervisor Engine Image rcp Download Example




---

**Note** For a procedure on downloading a supervisor engine software image from an rcp server, see the [“Downloading the Supervisor Engine Images Using rcp”](#) section on page 27-16.

---

This example shows a complete rcp download procedure of a supervisor engine software image to a Catalyst 6500 series switch:

```

Console> (enable) copy rcp flash
IP address or name of remote host []? 172.20.52.3
Name of file to copy from []? cat6000-sup.5-2-1-csx.bin
Flash device [bootflash]?
Name of file to copy to [cat6000-sup.5-2-1-csx.bin]?

4369664 bytes available on device bootflash, proceed (y/n) [n]? y
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCC
File has been copied successfully.
Console> (enable) set boot system flash bootflash:cat6000-sup.5-2-1-csx.bin prepend
BOOT variable = bootflash:cat6000-sup.5-2-1-csx.bin,1;bootflash:cat6000-sup.5-2-
1-csx.bin,1;
Console> (enable) reset system
This command will reset the system.
Do you want to continue (y/n) [n]? y
Console> (enable) 09/2/1999,13:51:39:SYS-5:System reset from Console//

```



## Single Module Image rcp Download Example



### Note

For a procedure on downloading the software images to the intelligent modules, see the [“Downloading the Switching Module Images Using rcp”](#) section on page 27-17.

This example shows a complete rcp download procedure of an ATM software image to a single ATM module:

```

Console> (enable) show version 4
Mod Port Model      Serial #  Versions
-----
4   1   WS-X6101   003414855 Hw : 1.2
                               Fw : 1.3
                               Sw : 3.2(6)

Console> (enable) copy rcp 4/flash
IP address or name of remote host []? 172.20.52.3
Name of file to copy from []? cat6000-atm.3-2-7.bin
Download image rcp:cat6000-atm.3-2-7.bin to Module 4 FLASH (y/n) [n]? y
This command will reset Download Module(s) you selected.

Do you wish to continue download flash (y/n) [n]? y

Download done for module 4, please wait for it to come online

File has been copied successfully.
Console> (enable) 09/2/1999,13:13:54:SYS-5:Module 4 is online

Console> (enable) show version 4
Mod Port Model      Serial #  Versions
-----
4   1   WS-X6101   003414855 Hw : 1.2
                               Fw : 1.3
                               Sw : 3.2(7)

Console> (enable)

```

## Multiple Module Image rcp Download Example



### Note

For a procedure on downloading the software images to the intelligent modules, see the [“Downloading the Switching Module Images Using rcp”](#) section on page 27-17.

This example shows a complete rcp download procedure of an ATM software image to multiple ATM modules:

```

Console> (enable) show version 4
Mod Port Model      Serial #  Versions
-----
4   1   WS-X6101   003414855 Hw : 1.2
                               Fw : 1.3
                               Sw : 3.2(6)

Console> (enable) show version 5
Mod Port Model      Serial #  Versions
-----
5   1   WS-X6101   003414463 Hw : 1.2
                               Fw : 1.3
                               Sw : 3.2(6)

Console> (enable) copy rcp flash
IP address or name of remote host []? 172.20.52.3
Name of file to copy from []? cat6000-atm.3-2-7.bin
Download image rcp:cat6000-atm.3-2-7.bin to Module 4 FLASH (y/n) [n]? y
Download image rcp:cat6000-atm.3-2-7.bin to Module 5 FLASH (y/n) [n]? y
This command will reset Download Module(s) you selected.

Do you wish to continue download flash (y/n) [n]? y
-
Download done for module 4, please wait for it to come online
Download done for module 5, please wait for it to come online

File has been copied successfully.
Console> (enable) 09/2/1999,12:25:10:SYS-5:Module 4 is online
09/2/1999,12:25:10:SYS-5:Module 5 is online

Console> (enable) show version 4
Mod Port Model      Serial #  Versions
-----
4   1   WS-X6101   003414855 Hw : 1.2
                               Fw : 1.3
                               Sw : 3.2(7)

Console> (enable) show version 5
Mod Port Model      Serial #  Versions
-----
5   1   WS-X6101   003414463 Hw : 1.2
                               Fw : 1.3
                               Sw : 3.2(7)

Console> (enable)

```

## Uploading the System Software Images to an rcp Server

These sections describe how to upload the system software images from a switch to an rcp server:

- [Preparing to Upload an Image to an rcp Server, page 27-22](#)
- [Uploading the Software Images to an rcp Server, page 27-22](#)



### Note

For more information on working with the system software image files on the flash file system, see [Chapter 26, “Working With the Flash File System.”](#)

## Preparing to Upload an Image to an rcp Server

Before you attempt to upload a software image to an rcp server, do the following:

- Verify that the workstation acting as the rcp server is configured properly.
- Verify that the switch has a route to the rcp server. The switch and the rcp server must be in the same subnetwork if you do not have a router to route the traffic between the subnets. Check the connectivity to the rcp server by entering the **ping** command.
- If you are overwriting an existing file (including an empty file, if you had to create one), verify that the permissions on the file are set correctly. The permissions on the file should be set to write for the specific username.

## Uploading the Software Images to an rcp Server

To upload a software image on a switch to an rcp server for storage, perform these steps:

- 
- Step 1** Log into the switch through the console port or a Telnet session.
- Step 2** Upload the software image to the rcp server using the **copy flash rcp** command. When prompted, specify the rcp server address and destination filename. On those platforms that support the flash file systems, you are first prompted for the flash device and source filename. If desired, you can use the **copy file-id rcp** command on these platforms.

The software image is uploaded to the rcp server.

---

This example shows how to upload the supervisor engine software image to an rcp server:

```

Console> (enable) copy flash rcp
Flash device [bootflash]? slot0:
Name of file to copy from []? cat6000-sup.5-3-1.bin
IP address or name of remote host [172.20.52.3]? 172.20.52.10
Name of file to copy to [cat6000-sup.5-3-1.bin]?
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
|
File has been copied successfully.
Console> (enable)

```

## Downloading the Crypto Images Using SCP

The Secure Copy (SCP) provides a secure and authenticated method for copying the crypto image files. SCP relies on Secure Shell (SSH) and requires that AAA authorization be configured so that the system can determine whether the user has the correct privilege level.

SCP allows a user who has appropriate authorization to copy a crypto file to and from the system by using the **copy** command. An authorized network administrator may also perform this action from a workstation.

Because SCP relies on SSH for its secure transport, the system must have an RSA key pair. You must configure and enable SSH and configure authentication and authorization correctly before you can enable SCP. For information on configuring AAA, see [Chapter 39, “Configuring the Switch Access Using AAA.”](#)

These sections describe how to download the system software crypto images to the switch supervisor engine:

- [Preparing to Download an Image Using SCP, page 27-23](#)
- [Downloading the Crypto Images Using SCP, page 27-23](#)
- [Example SCP Download Procedure, page 27-24](#)

## Preparing to Download an Image Using SCP

Before you begin downloading a software image using SCP, do the following:

- Verify that the workstation acting as the SCP server supports the secure shell (SSH).
- Verify that the server supports a command shell that has an SSH v1 or SSH v2-compatible **scp** command available.



---

**Note** With software release 8.6(1) and later releases, SCP supports SSH v2.

---

- Verify that the switch has a route to the SCP server. The switch and the SCP server must be in the same subnetwork if you do not have a router to route the traffic between the subnets. Check the connectivity to the SCP server using the **ping** command.
- A power interruption (or other problem) during the download procedure can corrupt the flash code. If the flash code is corrupted, you can connect to the switch through the console port and boot from an uncorrupted system image on a Flash PC card.

## Downloading the Crypto Images Using SCP

To download a supervisor engine software image to the switch from an SCP server, perform these steps:

- 
- Step 1** Copy the software image file to the appropriate SCP directory on the workstation.
- Step 2** Log into the switch through the console port or through an SSH session. If you log in using Telnet, your Telnet session disconnects when you reset the switch to run the new software.
- Step 3** Download the software image from the SCP server by entering the **copy scp flash** command. When prompted, enter the IP address or host name of the SCP server and the name of the file to download. On those platforms that support the flash file system, you are also prompted for the flash device to which to copy the file and the destination filename.

The switch downloads the image file from the SCP server.



---

**Note** The switch remains operational while the image downloads.

---

- Step 4** Modify the BOOT environment variable by entering the **set boot system flash device:filename prepend** command, so that the new image boots when you reset the switch. Specify the flash device (*device:*) and the filename of the downloaded image (*filename*).
- Step 5** Reset the switch by entering the **reset system** command. If you are connected to the switch through Telnet, your Telnet session disconnects.

During startup, the flash memory on the supervisor engine is reprogrammed with the new flash code.



```
Leaving power_on_diags

Cafe Daughter Present.

EOBC link up

Boot image: cat6000-sup720cvk9.8-3-1.bin
Flash Size = 0X1000000, num_flash_sectors = 64
readCafe2Version: 0x00000001
RIn Local Test Mode, Pinnacle Synch Retries: 2
Running System Diagnostics from this Supervisor (Module 1)
This may take up to 2 minutes...please wait

Cisco Systems Console

Enter password:
11/25/2003,13:52:51:SYS-5:Module 1 is online
11/25/2003,13:53:11:SYS-5:Module 4 is online
11/25/2003,13:53:11:SYS-5:Module 5 is online
11/25/2003,13:53:14:PAGP-5:Port 1/1 joined bridge port 1/1.
11/25/2003,13:53:14:PAGP-5:Port 1/2 joined bridge port 1/2.
11/25/2003,13:53:40:SYS-5:Module 2 is online
11/25/2003,13:53:45:SYS-5:Module 3 is online
Console> (enable)
```

## Uploading the Crypto Images to an SCP Server

These sections describe how to upload the system software images from a switch to an SCP server:

- [Preparing to Upload an Image to an SCP Server, page 27-25](#)
- [Uploading the Crypto Images to an SCP Server, page 27-26](#)



### Note

---

For more information on working with the system software image files on the flash file system, see [Chapter 26, “Working With the Flash File System.”](#)

---

## Preparing to Upload an Image to an SCP Server

Before you attempt to upload a software image to an SCP server, do the following:

- Verify that the workstation acting as the SCP server is configured properly.
- Verify that the switch has a route to the SCP server. The switch and the SCP server must be in the same subnetwork if you do not have a router to route the traffic between the subnets. Check the connectivity to the rcp server by entering the **ping** command.
- If you are overwriting an existing file (including an empty file, if you had to create one), verify that the permissions on the file are set correctly. The permissions on the file should be set to write for the specific username.

## Uploading the Crypto Images to an SCP Server

To upload a crypto image on a switch to an SCP server for storage, perform these steps:

- 
- Step 1** Log into the switch through the console port or an SSH session.
  - Step 2** Upload the software image to the rcp server by entering the **copy flash scp** command. When prompted, specify the SCP server address and destination filename. On those platforms that support the flash file systems, you are first prompted for the flash device and source filename. If desired, you can enter the **copy file-id scp** command on these platforms.

The image is uploaded to the SCP server.

---

This example shows how to upload the crypto image to an SCP server:

```

Console> (enable) copy bootflash scp
Flash device [bootflash]? slot0:
Name of file to copy from []? cat6000-sup720cvk9.8-3-1.bin
Username for scp[bob]?
Password for User bob[]:
IP address or name of remote host [172.20.52.3]? 172.20.52.10
Name of file to copy to [cat6000-sup720cvk9.8-3-1.bin]?
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
File has been copied successfully.
Console> (enable) .

```

## Downloading the Crypto Images Using SFTP



### Note

---

The Secure File Transfer Protocol (SFTP) is available only in crypto images.

---

FTP provides a file transfer capability, but with FTP, passwords and data files are transferred in plain text. SFTP provides a secure encrypted channel for passwords and data transmission across the network.

SFTP uses the SSH protocol for establishing a secure channel between the client and the server. SFTP is supported only with SSHv2. SFTP with SSHv1 is not supported.

SFTP client functionality is supported. SFTP server functionality is not supported.

To download a supervisor engine crypto software image to the switch from an SFTP server, perform these steps:

- 
- Step 1** Verify that the switch has a route to the SFTP server. The switch and the SFTP server must be in the same subnetwork if you do not have a router to route the traffic between the subnets. Check the connectivity to the SFTP server by entering the **ping** command.
  - Step 2** Copy the software image file to the appropriate SFTP directory on the workstation.
  - Step 3** Log into the switch through the console port or through a Telnet session. If you log in using Telnet, your Telnet session disconnects when you reset the switch to run the new software.

- Step 4** Enter the **copy sftp destination** command. When prompted, enter the IP address or hostname of the SFTP server and the name of the file to download. You are also prompted for the flash device to which to copy the file and the destination filename. Enter your username and password. The switch downloads the image file from the SFTP server to the specified flash device.



**Note** The switch remains operational while the image downloads.

- Step 5** Modify the BOOT environment variable by entering the **set boot system flash device:filename prepend** command, so that the new image boots when you reset the switch. Specify the flash device (*device:*) and the filename of the downloaded image (*filename*).

- Step 6** Reset the switch by entering the **reset system** command. If you are connected to the switch through Telnet, your Telnet session disconnects.

During startup, the flash memory on the supervisor engine is reprogrammed with the new flash code.

- Step 7** When the switch reboots, enter the **show version** command to check the version of the code on the switch.

## Uploading the Crypto Images to an SFTP Server

To upload a supervisor engine crypto software image from the switch to an SFTP server, perform these steps:

- Step 1** Log into the switch through the console port or a Telnet session.

- Step 2** Upload the software image to the SFTP server with the **copy source sftp** command. When prompted, specify the SFTP server address and destination filename. You are first prompted for the flash device and the source filename. Enter your username and password. The switch uploads the image file from the flash device on the switch to the SFTP server.



**Note** In the examples below, you can stop the copy process by entering Control+C at any time.

This example shows how to download a software image from an SFTP server to the switch:

```
Console> (enable) copy sftp <switch name>
IP address or name of remote host [10.6.1.10]?
Name of file to copy from [/tmp/bob/test2]?
Username for sftp[]? <username>
Password for User bob[]: <password>
37562980 bytes available on device bootflash, proceed (y/n) [n]? y
```

```
File has been copied successfully.
Console> (enable) copy sftp bootflash:
IP address or name of remote host []? <IP address>
Username for sftp[bob]?
Password for User bob[]:
Name of file to copy from []? <filename>
```

```
Can not open source file scp:/tmp/tin/test2 (SCP authentication error)
Copy from switch to SFTP Server
copy <source> sftp
```

Copying a file to an SFTP server is similar. You will be asked for the destination host and pathname and the copy process will occur without additional confirmation.

```
Console> (enable) copy bootflash:test2 sftp
IP address or name of remote host [10.6.1.10]?
Name of file to copy to [/tmp/bob/test2]?
Username for sftp[bob]?
Password for User bob[]:
CCC/
File has been copied successfully.
```

## Downloading the Software Images Over a Serial Connection on the Console Port

These sections describe how to perform a serial download of the software images over the supervisor engine console port using Kermit, which is a popular file-transfer and terminal-emulation software program:

- [Preparing to Download an Image Using Kermit, page 27-28](#)
- [Downloading the Software Images Using Kermit \(PC Procedure\), page 27-29](#)
- [Downloading the Software Images Using Kermit \(UNIX Procedure\), page 27-30](#)
- [Example Serial Software Image Download Procedures, page 27-31](#)

## Preparing to Download an Image Using Kermit

Before you begin a serial download of a software image using Kermit, do the following:

- On a UNIX workstation, verify that your shell window is local (not an **rlogin** window to a different workstation).
- Verify that the supervisor engine console port is connected to a serial port on your PC or workstation with a serial cable.
- Verify that the Kermit software is installed on your PC or workstation.
- Verify that the line speed settings are the same on the PC or workstation and on the switch:
  - On the switch, you can change the console port speed by entering the **set system baud rate** command. The default baud rate is 9600 baud.
  - On the PC or workstation, you can change the baud rate of the serial port by entering the **set speed rate** command at the Kermit> prompt.



### Caution

To prevent communication problems, do not use a speed greater than 19,200 baud.

- Ensure that Kermit is using the proper serial port by doing the following:
  - On a PC, specify the serial port by entering the **set port comx** command, where *x* is the PC serial port number (1 through 8) that you connected to the switch.
  - On a UNIX workstation, specify the serial port by entering the **set port /dev/ttyx** command, where *x* is the serial port (a or b) that you connected to the switch.

## Downloading the Software Images Using Kermit (PC Procedure)

**Note**

This procedure applies to the PC serial downloads only. For information on performing a serial download on a UNIX workstation, see the [“Downloading the Software Images Using Kermit \(UNIX Procedure\)” section on page 27-30](#).

To perform a serial download of a software image over the supervisor engine console port, perform these steps:

**Step 1** Copy the software image file to the directory where Kermit is loaded.

**Step 2** Start Kermit on the PC.

**Note**

Before continuing, ensure that the line speed is correct and that you have selected the proper serial line, as described in the [“Preparing to Download an Image Using Kermit” section on page 27-28](#).

**Step 3** At the Kermit> prompt, enter the **connect** command to connect to the switch. If your line and speed are set correctly, the switch Console> prompt appears.

**Step 4** Enter the **enable** command to enter privileged mode.

**Step 5** Enter the **download serial** command. The file is downloaded to module 1 by default.

**Step 6** When prompted, confirm the download.

**Step 7** Enter the escape sequence **Ctrl-]-c** by holding down the **Ctrl** key while you press **]**, and then press **c**.

**Step 8** At the Kermit> prompt, enter the **send filename** command to send the file to the switch.

The switch downloads the image file, erases the flash memory on the supervisor engine or the appropriate module, and reprograms the flash memory with the downloaded flash code.

**Note**

The switch remains operational while the image downloads.

**Step 9** When the Kermit> prompt reappears, enter the **connect** command to return to the switch Console> prompt. You will see the status information as the switch erases and reprograms the flash memory.

**Note**

If you enter the **connect** command more than 2 minutes after the Kermit> prompt reappears, you might see only a Console> prompt instead of the status information about erasing and programming flash code.

**Step 10** Reset the switch using the **reset system** command.

**Step 11** When the switch reboots, enter the **show version [mod]** command to check the version of the code on the switch.

**Note**

For an example that shows a complete serial download procedure using Kermit on a PC, see the [“PC Serial Download Procedure Example” section on page 27-31](#).

## Downloading the Software Images Using Kermit (UNIX Procedure)


**Note**

This procedure applies to the UNIX serial downloads only. For information on performing a serial download on a PC, see the [“Downloading the Software Images Using Kermit \(PC Procedure\)”](#) section on page 27-29.

Use this procedure to perform a serial download of a software image over the supervisor engine console port.

To copy the software to the workstation, log in as root, and perform these steps:

- 
- Step 1** Copy the software image file to your home directory.
- Step 2** At the UNIX command prompt, start Kermit by entering the **kermit** command (make sure that the directory where Kermit is installed is included in the \$PATH environment variable on the workstation).


**Note**

Before continuing, ensure that the line speed is correct and that you have selected the proper serial line, as described in the [“Preparing to Download an Image Using Kermit”](#) section on page 27-28.

- Step 3** At the C-Kermit> prompt, enter the **connect** command to connect to the switch. If your line and speed are set correctly, the switch Console> prompt appears.
- Step 4** Enter the **enable** command to enter privileged mode.
- Step 5** Enter the **download serial** command. The file downloads to module 1 by default.
- Step 6** When prompted, confirm the download.
- Step 7** Enter the escape sequence **Ctrl-\-c** by holding down the **Ctrl** key while you press **\**, and then press **c**.
- Step 8** At the Kermit> prompt, enter the **send filename** command to send the file to the switch.

You can monitor the progress of the download by pressing the **a** key at any time during the Kermit download. A dot appears onscreen for every four packets that are transferred. If there is a problem transferring the file, one or more of the following letter codes appear:

- T—Kermit timed out.
- N—Kermit is not acknowledging the switch download process.
- E—Kermit detected an error in the progress of the transaction.

The switch downloads the image file, erases the flash memory on the supervisor engine or the appropriate module, and reprograms the flash memory with the downloaded flash code.


**Note**

The switch remains operational while the image downloads.

- Step 9** Press **Return** to return to the C-Kermit> prompt. When the Kermit> prompt reappears, enter the **connect** command to return to the switch Console> prompt. You will see the status information as the switch erases and reprograms the flash memory.



**Note** If you enter the **connect** command more than 2 minutes after the Kermit> prompt reappears, you might see only a Console> prompt instead of the status information about erasing and programming flash code.

- Step 10** Reset the switch by entering the **reset system** command.
- Step 11** When the switch reboots, enter the **show version [mod]** command to check the version of the code on the switch.



**Note** For an example that shows a complete serial download procedure using Kermit on a UNIX workstation, see the “[UNIX Workstation Serial Download Procedure Example](#)” section on page 27-32.

## Example Serial Software Image Download Procedures

These sections show the example serial download procedures over the supervisor engine console port using Kermit:

- [PC Serial Download Procedure Example, page 27-31](#)
- [UNIX Workstation Serial Download Procedure Example, page 27-32](#)

### PC Serial Download Procedure Example

This screen output shows an example of a complete serial download procedure on a PC:

```
C:\ copy A:\*.*
copying c6509_xx.bin
C:\ kermit
Kermit, 4C(057) 06 Apr 98, 4.2 BSD
Type ? for help
Kermit> set port com1
Kermit> set speed 9600
Kermit> connect
Connecting to com1,speed 9600.
The escape character is ^] (ASCII 29).
Type the escape character followed by C to get back,
or followed by ? to see other options

Console> enable
Console> (enable) download serial
Download CBI image via console port (y/n) [n]? y

Waiting for DOWNLOAD!
Return to your local Machine by typing its escape sequence
Issue Kermit send command from there[ Send `Filename`]

<CONTROL-] c to return to Local Machine>

Kermit> send c6509_xx.bin

File name: c6509_xx.bin
KBytes transferred: xxxx
```

```

Percent transferred: 100%
      Sending: Complete

Number of Packets: xxxx
Number of retries: None
      Last error: None
      Last warning: None
Kermit> connect

Finished network download. (1136844 bytes)
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
The system needs to be reset to run the new image.

Cisco Systems Console
Enter password:
Mon Apr 06, 1998, 14:35:08
Console>

```

## UNIX Workstation Serial Download Procedure Example

This screen output shows an example of a complete serial download procedure on a UNIX workstation:

```

workstation% cd /tmp
workstation% tar -xvfp /dev/rfd0
c5009_xx.bin, 1156046 bytes, 2258 tape blocks
workstation% ls -la
total 1150
drwxrwsrwt  5 bin           512 Sep 28 04:15 .
drwxr-xr-x 18 root        1536 Sep 27 15:41 ..
-r--r--r--  1 60000       1156046 Jul 18 10:32 c5009_xx.bin
workstation% kermit
C-Kermit, 4E(072) 06 Apr 98, SUNOS 4.x
Type ? for help
C-Kermit> set line /dev/ttya
C-Kermit> set speed 9600
/dev/ttya: 9600 baud
C-Kermit> connect
Connecting thru /dev/ttya, speed 9600.
The escape character is CTRL-\ (28).

Type the escape character followed by C to get back,
or followed by ? to see other options.

Console> enable
Console> (enable) download serial c5009_XX.bin

Download CBI image via console port (y/n) [n]? y

Waiting for DOWNLOAD!
Return to your local Machine by typing its escape sequence

```

```
Issue Kermit send command from there[ Send `Filename`]
[Back at Local System]
C-Kermit> send c5009_xx.bin
SF
c5009_xx.bin => c5009_xx.bin, Size: 1156046
```

```
CTRL-F to cancel file, CTRL-R to resend current packet
CTRL-B to cancel batch, CTRL-A for status report:
```

```
.....
*** Display Truncated ***
.....
..... [OK]
```

```
ZB?
C-Kermit> connect
Connecting thru /dev/ttya, speed 9600.
The escape character is CTRL-\ (28).
Type the escape character followed by C to get back,
or followed by ? to see other options.
```

```
Download OK
Initializing Flash
Programming Flash
Base....Code....Length....Time....Done
```

```
Cisco Systems Console
Enter password:
Mon Apr 06, 1998, 17:35:08
Console>
```

## Downloading a System Image Using Xmodem or Ymodem

When you need a system image on the switch, but the switch does not have network access and you do not have a software image on a Flash PC card, you can download an image from a local or remote computer (such as a PC, UNIX workstation, or Macintosh) through the console port using the Xmodem or Ymodem protocol.

The Xmodem and Ymodem protocols are used to transfer files and are included in applications such as Windows 3.1 (TERMINAL.EXE), Windows 95 (HyperTerminal), Windows NT 3.5x (TERMINAL.EXE), Windows NT 4.0 (HyperTerminal), and Linux UNIX freeware (minicom).

The Xmodem and Ymodem downloads are slow. Use them only when the switch does not have network access. You can speed up the transfer by setting the console port speed to 38400 bps.

The Xmodem and Ymodem file transfers are performed from the ROM monitor with this command:

```
xmodem [-y] [-c] [-s data-rate]
```

where **-y** uses the Ymodem protocol, **-c** provides CRC-16 checksumming, and **-s** sets the console port data rate.

The computer from which you transfer the supervisor engine software image must run terminal emulation software that supports the Xmodem or Ymodem protocol.

This procedure shows a file transfer using the Xmodem protocol. To use the Ymodem protocol, include the **-y** keyword with the **xmodem** command.

**Caution**

A modem connection from the telephone network to your console port can introduce security issues that you should consider before enabling the connection. For example, the remote users can dial into your modem and access the switch configuration settings.

**Caution**

If you have redundant supervisor engines, you must remove the second (redundant) supervisor engine before you perform this procedure. The image that is downloaded through Xmodem is not saved to memory; therefore, after the download if you have two supervisor engines that are installed and attempt to reboot the active supervisor engine with the downloaded image, the redundant supervisor engine will take over and synchronize with the active supervisor engine. The downloaded image will not be booted.

**Step 1** Place a supervisor engine software image on the computer's hard drive. You can download an image from Cisco.com (see the "Preface" section for details).

**Step 2** To download from a local computer, connect the console port (port mode switch in the *in* position) to a serial port on the computer using a null-modem cable. The console port speed must match the speed that is configured on the local computer.

**Note**

If you are transferring from a local computer, you may need to configure the terminal emulation program to ignore the RTS/DTR signals.

- Step 3** To download from a remote computer, do the following:
- a. Connect a modem to the console port and to the telephone network.
  - b. Note that the modem and console port must communicate at the same speed, which can be from 1200 to 38400 bps, depending on the speed that is supported by your modem. Enter the **confreg** ROM monitor command to configure the console port transmission speed.
  - c. Connect a modem to the remote computer and to the telephone network and configure it for the same speed as the supervisor engine.
  - d. Dial the number of the supervisor engine modem from the remote computer.

**Step 4** Enter the **xmodem** command at the ROM-monitor prompt in the terminal emulation window:

```
rommon > xmodem -s 38400 -c
```

**Step 5** Start an Xmodem or Ymodem send operation with the computer's terminal emulation software. The computer downloads the system image to the supervisor engine. See your terminal emulation software application manual for instructions on how to execute a Xmodem or Ymodem file transfer.

After the new image is completely downloaded, the ROM monitor boots it.

**Note**

Downloading an image through the console port does not create an image file on any of the flash devices. The downloaded image resides only in memory. You cannot save the image in memory as a file.

- Step 6** After the download, the console port returns to 9600, which is the default baud rate. If the download took place at other than 9600 baud, you must change the remote computer's baud rate back to 9600 baud.
- Step 7** Establish network connectivity to the switch to copy an image file from a TFTP server to one of the flash devices.

## Verifying the Software Images



**Note** This feature is not supported on Supervisor Engine 1.

Because a software image goes through a sequence of transfers before it is copied into the memory of the switch, the integrity of the image is at risk each time that it is downloaded from Cisco.com. The image size and checksum are automatically checked when the image is copied, but these types of checks do not ensure that the downloaded image has not been corrupted. To ensure the integrity of any images that you download, use the **set image-verification** command. You can set image verification to work when booting, after the image has been copied, or before a system reset.

To enable the image verification, perform this task in privileged mode:

	Task	Command
<b>Step 1</b>	Enable the image verification.	<b>set image-verification [boot   copy   reset] enable</b>
<b>Step 2</b>	Verify the image verification setting.	<b>show image-verification</b>

This example shows how to enable the image verification upon a switch reset:

```
Console> (enable) set image-verification reset enable
Console> (enable)
```

This example shows how to verify the image verification settings:

```
Console> (enable) show image-verification
Image Verification Status:
Boot: Disable
Copy: Disable
Reset: Enable
Console> (enable)
```

